

WE CLAIM:

1. A switchable optical add/drop device comprising:
a DWDM R-channel assembly;
a collimator assembly; and
5 a switching device removeably positioned therebetween so as to optionally perform a by-pass mode or an add/drop function.
2. The device as defined in claim 1, wherein said R-channel assembly includes first and second R-channels spatially opposite to each other.
3. The device as defined in claim 2, wherein the first R-channel includes
10 a first GRIN lens, the first DWDM filter, and a first fiber connected to an IN port of said first R-channel, and the second R-channel includes a second GIN lens, a second DWDM filter, and a second fiber connected to an OUT port of said second R-channel.
4. The device as defined in claim 3, wherein said first R-channel and
15 said second R-channel are structurally the same.
5. The device as defined in claim 4, wherein said first R-channel and said second R-channel are face to face disposed with each other with said first filter and said second filter confronting each other.
6. The device as defined in claim 4, wherein a first path is defined
20 between the first filter and the second filter for passage of the filtered wavelength channel.
7. The device as defined in claim 4, wherein a second path is defined
25 between said first R-channel and said second R-channel, said second path being connected to the first R-channel on the same side of the IN port and to the second R-channel on the same side of the OUT port.

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8. The device as defined in claim 1, wherein the collimator assembly includes first and second collimator respectively defining ADD and DROP ports.
 9. The device as defined in claim 1, wherein said switching device is a prism.
 10. The device as defined in claim 1, wherein said prism blocks signal ways of the R-channel assembly and of the collimator assembly and forms the switchable paths therein for switching.
 11. A switchable optical add/drop device comprising:
 - 10 first and second DWDM R-channels functioning as IN and OUT ports, respectively;
 - first and second collimators functioning as ADD and DROP ports, respectively ; and
 - 15 a switching device removably disposed among said first and second R-channels and said first and second collimators so that the device functions as a switchable add/drop device with existence of the switching device while functions as a by-pass mode with removal of said switching device.
 12. The device as defined in claim 11, wherein said first and second DWDM R-channels are substantially structurally same with each other each with a GRIN lens and a DWDM filter for the same specific wavelength channel.
 13. The device as defined in claim 11, wherein said first R-channel and said first collimator are arranged on one side of said switching device, and the second R-channel and said second collimator are arranged on the other side of said switching device.

14. The device as defined in claim 13, wherein said switching device is a prism.
15. A method of optionally switchably adding/dropping channels of a signal, comprising the steps of:
- 5 (1) providing first and second R-channels spatially opposite to each other, said first R-channel defining an IN port and said second R-channel defining an OUT port;
- (2) defining a first path between two near ends of said first and second R-channels, and a second path between two far ends of said first and second R-channels;
- 10 (3) providing first and second collimators with ADD and DROP ports, respectively; and
- (4) removably positioning a switching device among said first and second R-channels and said first and second collimators for blocking the first path as a switchable optical add/drop device or for not block the first path as a by-pass mode.
- 15 16. The method as defined in claim 15, wherein said switching device defines two switching path respectively guiding a filtered wavelength channel from the first path and an added wavelength channel from the first collimator.
- 20 17. The method as defined in claim 15, wherein said first and second R-channels are substantially structurally the same with the same filter thereof for the same specific wavelength channel.
18. An arrangement of switchably adding/dropping wavelength channels with regard to a multiplex signal, comprising:
- 25 a first path for transmitting a specific wavelength channel;

a second path for transmitting the rest of the wavelength channels in said multiplex signal and directing to an OUT port;

a third path for either switching the filtered specific wavelength channel in the first path to a DROP port or adding the specific wavelength channel from an ADD port to the first path.

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19. The arrangement as defined in claim 18, wherein said first path is defined between two near ends of first and second R-channels, and said second path is defined between two far ends of said first and second R-channels.

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20. The arrangement as defined in claim 18, wherein said third path is defined by a switching device.

21. A subassembly of a switchable optical add/drop device comprising:
a first R-channel including a first GRIN lens and a first DWDM filter;
a first fiber connected to the first GRIN lens opposite to the first DWDM filter and functioning as an IN port;

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a second R-channel including a second GRIN lens and a second DWDM filter;

a second fiber connected to the second GRIN lens opposite to the second DWDM filter and functioning as an OUT port;

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said first R-channel and said second R-channel being face to face disposed with each other with the first filter and the second filter confronting each other;

a first path defined between the first filter and the second filter; and

a second path defined between the first GRIN lens and the second GRIN lens around the IN and OUT ports; whereby

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said subassembly may cooperate with a removable switching device to switchably add/drop the specific wavelength channel or perform a by-pass mode with minimum insertion loss.

- 5 22. The subassembly as defined in claim 20, wherein said first filter and said second filter are same.
23. The subassembly as defined in claim 20, wherein said first R-channel and said second R-channel are substantially structurally same with each other.